

**AMENDMENTS TO THE DRAWINGS**

**Please see the attached replacement drawing sheet for Fig. 8.**

Fig. 8 has been amended to include the reference character “R” to designate a range of space wherein an electromagnetic wave absorber may be present.

A mark-up sheet further illustrating the above changes have been provided in addition to the Replacement Drawing Sheets for the Examiner’s convenience.

### REMARKS

Claims 1-20 are presently pending in this application. Claims 1-19 have been amended to more particularly define the claimed invention. Claim 20 has been added to claim additional features of the claimed invention.

It is noted that the amendments are made only to more particularly define the invention and **not** for distinguishing the invention over the prior art, for narrowing the scope of the claims, or for any reason related to a statutory requirement for patentability. It is further noted that, notwithstanding any claim amendments made herein, Applicant's intent is to encompass equivalents of all claim elements, even if amended herein or later during prosecution.

The drawings were objected to under 37 C.F.R. § 1.83(a). First, the claim language has been amended to no longer recite “*both end sides in a front-rear direction of the shielding conductor project from both side ends of the chip part,*” in claim 3, but now recites, “*opposed opening end sections projecting in a front-rear direction of the shielding conductor and the chip part.*” Further, the electromagnetic wave absorber, as found in the specification, e.g., at page 22, line 19, is shown in Fig. 8 by reference character R. Additionally, the “*two-terminal chip part,*” is clearly shown, e.g., in Figs. 19-20.

The abstract was objected to due to reference characters not shown in parenthesis. All reference numbers have been removed in the replacement paragraph.

The specification was objected to at page 11, line 14, and “*FIGS.*” has been changed to “*Numerals.*”

Additionally, all instances in the Specification of the language, “...claim(s)...,” have been removed with appropriate replacement paragraphs.

Claims 17-18 are objected to due to informalities. Applicant's have amended the claims to correct these informalities as follows: the language "characterized by comprising," has been amended to recite "comprising."

Claim 5 is rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. The Office Action states that the claim recitation of "harmonic mean" is not adequately described in the specification. Applicants respectfully traverse this claim rejection and maintains that a "harmonic mean" is a commonly known mathematical method for calculating an average between at least two numbers. Generally the harmonic mean (H) of the positive real numbers  $a_1, \dots, a_n$  is defined to be:

$$H = n / ( 1/a_1 + 1/a_2 + \dots 1/a_n ).$$

E.g., when dealing with only two numbers, an equivalent formula for calculating the harmonic mean (H) is:

$$H = (2a_1 \cdot a_2) / (a_1 + a_2).$$

Claims 3, 4 and 6 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. With respect to claim 3, the claim has been amended to recite, "*opposed opening end sections projecting in a front-rear direction of the shielding conductor and the chip part.*" With respect to claim 5, the claim has been amended to recite, "*...larger than an area defined by terminals of the chip part.*" And with respect to claim 6, the claim has been amended to now depend from independent claim 2 that recites, "openings."

Claims 1-2, 6-7, 12 and 1-19 stand rejected under 35 U.S.C. §102(b) as being unpatentable over Nardoni et al., EP000812015A1.

Claims 3-5, 8-10 and 13-14 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Nardoni et al., EP000812015A1.

Claims 11 and 15-16 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Nardoni et al., EP000812015A1 in view of JP2940478.

These rejections are respectfully traversed in view of the following discussion.

## **I. APPLICANT'S CLAIMED INVENTION**

The claimed invention (as defined, for example, by independent claim 1) is directed to an electronic device including a chip part having an upper surface, a shielding conductor united with the upper surface of the chip part. The shielding conductor further includes a ceiling plate section covering the chip part and opposed side plate sections united with and extending below the ceiling plate section and projecting in a horizontal direction around only two sides of the chip part. The invention further includes a mounting substrate having a ground layer, wherein the side plate sections are electrically connected to the ground layer via a plurality of connecting means. The width  $W$  of the ceiling plate section in a front-rear direction is sized greater than or equal to twice the harmonic mean of the length  $L$  of the ceiling plate section in a horizontal direction between the opposed side plate sections and the height  $H$  of the ceiling plate section in a vertical direction above the mounting substrate.

Conventionally, the prior art has difficulty dissipating generated heat into the periphery, and a sufficient cooling effect cannot be obtained. Additionally, since a signal layer is disposed to pass through the inner layer of a mounting substrate, a drawback is that degrees of freedom are restricted in the design. Shielding caps have openings in their side surfaces where the cooling effect can be obtained using the openings. However, there exists a

drawback that the shielding effect is not sufficient. Furthermore, since any high-frequency circuit is substantially sealed by a shielding case, a drawback is that the generated heat cannot be easily dissipated and hence the sufficient cooling cannot be obtained. (Application at page 3, line 27 to page 4, line 14).

The claimed invention (e.g., as recited in claims 1-3, 17 and 18), on the other hand, includes: “...a width  $W$  of the ceiling plate section in a front-rear direction is sized greater than or equal to twice a harmonic mean of a length  $L$  of the ceiling plate section in a horizontal direction between the opposed side plate sections and a height  $H$  of the ceiling plate section in a vertical direction above the mounting substrate,” of claims 1-2 and 18, (as disclosed in the Specification, e.g., at page 19, line 4), “...an electromagnetic wave absorber disposed between the chip part and at least one of the opposed opening end sections of the shielding conductor,” of claim 3, (as disclosed in the Specification, e.g., at page 22, line 8); and, “...mounting the chip part on a surface of the mounting substrate, and electrically connecting the shielding conductor to the ground layer at the same time,” of claim 17, (as disclosed in the Specification, e.g., at page 17, line 14).

## II. THE ALLEGED PRIOR ART REJECTIONS

### A. 35 U.S.C. § 102(b) Rejection over Nardoni et al., EP000812015A1

The Examiner alleges that Nardoni et al., EP000812015A1, (Nardoni), teaches the invention of claims 1-2, 6-7, 12 and 1-19. Applicant submits, however, that Nardoni does not teach or suggest each and every element and feature of the claimed invention.

With respect to independent claims 1 and 2, Applicants submit, however, that Nardoni et al does not teach or suggest each and every element of the claimed invention, specifically:

*“...a width  $W$  of the ceiling plate section in a front-rear direction is sized greater than or equal to twice a harmonic mean of a length  $L$  of the ceiling plate section in a horizontal direction between the opposed side plate sections and a height  $H$  of the ceiling plate section in a vertical direction above the mounting substrate.”*

The Office Action’s rejection of this recitation previously found in Applicants’ claim 5, states that it would have been an obvious matter of design choice to size the shielding conductor accordingly, since a change in dimensions or proportion is generally recognized as being within the level of ordinary skill in the art.

However, Applicants contend that the claim recitation conforming to the logical expression:

$$W \geq 2 \cdot (\text{Harmonic Mean of } L, H)$$

or,

$$W \geq 2 \cdot ( [2LH] / [L+H] ),$$

would not have been considered obvious to one of ordinary skill in the art.

Applicants’ claim recitations conforming to the above logical expression cannot be deemed a change in dimension or proportion being within the level of one of ordinary skill in the art absent any teaching or suggestion to do so or any suggestion of the significance of these parameters relative to a desired effect or result. (See M.P.E.P. § 2144.05.)

Other than merely covering a semiconductor device, Nardoni et al. fails to teach or suggest the dimension of the heat sink dissipater  $D$  conforming to any logical or mathematical expression, much less, “...the width  $W$  of the ceiling plate section ... is sized greater than or equal to twice the harmonic mean of the length  $L$  of the ceiling plate section ..., and the height  $H$  of the ceiling plate section.”

Therefore, Applicants respectfully request that the rejection of claims 1 and 2 be reconsidered and withdrawn.

With respect to Applicants' independent claim 17, Applicants submit, that Nardoni et al. does not teach or suggest each and every element of the claimed invention, specifically, *"...mounting the chip part on a surface of the mounting substrate, and electrically connecting the shielding conductor to the ground layer at the same time."*

Indeed, Nardoni et al. teaches away from Applicants' method claim limitation by disclosing that the semiconductor device IC is first attached to the substrate P with a high temperature solder SAT, and only after it is attached is a heat sink or dissipater D attached to the substrate P with a lower temperature solder SBT so as not to loosen the high temperature solder SAT connections of the semiconductor device IC. (See Column 4, lines 7-54, see specifically, lines 41-54).

Thus, Nardoni et al. fails to teach or suggest any operation of attaching the dissipater to the semiconductor device to form a single unit before attaching either component to the substrate, or attaching both components to the substrate at the same time.

Therefore, Applicants respectfully request that the rejection of claim 17 be reconsidered and withdrawn.

With respect to Applicants' independent claim 18, Applicants submit, that Nardoni et al. does not teach or suggest each and every element of the claimed invention, specifically the method of, *"...sizing a width W of a ceiling plate section of a shielding conductor in a front-rear direction greater than or equal to twice a harmonic mean of a length L of the ceiling plate section in a horizontal direction between opposed side plate sections and a height H of the ceiling plate section in a vertical direction above the mounting substrate."*

The Office Action's rejection of this recitation previously found in Applicants' claim 5, states that it would have been an obvious matter of design choice to size the shielding conductor accordingly, since a change in dimensions or proportion is generally recognized as being within the level of ordinary skill in the art. However, Applicants contend that the claim recitation conforming to the logical expression, as indicated above, would not have been considered obvious to one of ordinary skill in the art.

Again, Applicants' claim recitation conforming to the above logical expression cannot be deemed a change in dimension or proportion being within the level of one of ordinary skill in the art absent any teaching or suggestion to do so.

Other than merely covering a semiconductor device, Nardoni et al. fails to teach or suggest the dimension of the heat sink dissipater D conforming to any logical or mathematical expression, much less, "sizing a width  $W$  of a ceiling plate section ...greater than or equal to twice the harmonic mean of a length  $L$  of the ceiling plate section ..., and the height  $H$  of the ceiling plate section."

Therefore, Applicants respectfully request that the rejection of claim 18 be reconsidered and withdrawn.

**B. 35 U.S.C. § 103(a) Rejection over Nardoni et al., EP000812015A1**

The Examiner alleges that Nardoni et al., EP000812015A1, (Nardoni), teaches the invention of claims 3-5, 8-10 and 13-14. Applicant submits, however, that Nardoni does not teach or suggest each and every element and feature of the claimed invention.

With respect to independent claim 3, Applicants submit, that Nardoni et al does not teach or suggest each and every element of the claimed invention, specifically, "...an



*electromagnetic wave absorber disposed between the chip part and at least one of the opposed opening end sections of the shielding conductor.”*

The Examiner alleges that it would have been obvious to modify the device of Nardoni et al. with “difference types of configurations” since Applicants have not presented an explanation that “this configuration,” or, the electromagnetic wave absorber, “is significant or is anything more than one of numerous configurations.” The Examiner then alleges motivation for this position stating that “a change in shape or configuration is generally recognized as being within the level of ordinary skill in the art.”

However, in fact, Applicants submit that the Examiner can point to no motivation or suggestion in the reference to urge the teaching of Applicants’ recitation of the claim element of “an electromagnetic wave absorber”, as alleged by the Examiner to be merely “one of numerous configurations.” Applicants contend that the recited element of “an electromagnetic wave absorber” is not taught or suggested by Nardoni et al., nor is “an electromagnetic wave absorber” a configuration generally recognized as being within the level of ordinary skill in the art.” It is obvious to Applicants that the Office Action failed to meet the requirement for an “obvious-type rejection” by mischaracterizing Applicants’ “*electromagnetic wave absorber*,” not as a claim element, but rather, as merely a “configuration.” The significance of this element is defined by the meaning of its terminology.

Therefore, Applicants respectfully submit that one of ordinary skill in the art would not have been so motivated to teach or suggest Applicants’ claim recitation of an electromagnetic wave absorber as alleged by the Examiner to be merely “a configuration.” Therefore, the Examiner has failed to make a prima facie case of obviousness, and Applicants

respectfully request that the rejection of claim 3 be reconsidered and withdrawn.

Moreover, since the Examiner seems to invoke Official Notice, Applicants request that the Examiner provide a properly combinable reference demonstrating this feature.

With respect to the rejection of Applicant's claims 4-5, 8-10 and 13-14, Applicant respectfully submits that Nardoni fails to teach or suggest each and every element of the claimed invention, since Nardoni, as pointed out above, fails to teach or suggest each and every element of the claimed invention with respect to independent claims 1-3 and 17-18.

Therefore, the Examiner is respectfully requested reconsider and withdraw this rejection.

**C. 35 U.S.C. § 103(a) Rejection over Nardoni et al., EP000812015A1 in view of JP2940478**

The Examiner alleges that Nardoni et al., EP000812015A1, (Nardoni), in view of JP2940478, (JP-'478), teaches the invention of claims 11 and 15-16. Applicant submits, however, that Nardoni in view of JP-'478 does not teach or suggest each and every element and feature of the claimed invention.

The Examiner alleges that one of ordinary skill in the art would have been motivated to modify Nardoni with the teaching from JP-'478 to form the invention of claims 11 and 15-16. Applicant submits, however that these references would not have been combined and even if combined, the combination would not teach or suggest each and every element of the claimed invention.

Applicant respectfully submits that Nardoni would not have been combined with JP-'478 as alleged by the Examiner. Indeed, these references are completely non-analogous and therefore unrelated, and no person of ordinary skill in the art would have considered

combining these disparate references, absent impermissible hindsight.

In fact, Applicant submits that the Examiner can point to no motivation or suggestion in the references to urge the combination as alleged by the Examiner. Indeed, contrary to the Examiner ' s allegations, neither of these references teach or suggest their combination.

Therefore, Applicant respectfully submits that one of ordinary skill in the art would not have been so motivated to combine the references as alleged by the Examiner. Therefore, the Examiner has failed to make a prima facie case of obviousness.

Moreover, neither Nardoni, nor JP-'478, nor any alleged combination thereof teaches or suggests, “...an electromagnetic wave absorber disposed between the chip part and at least one of the opposed opening end sections of the shielding conductor.”

With respect to the rejection of Applicant's claims 11 and 15-16, Applicant respectfully submits that JP-'478 would not have been combined with Nardoni and even if combined, the combination would not teach or suggest each and every element of the claimed invention, since Nardoni, as pointed out above, fails to teach or suggest each and every element of the claimed invention, and JP-'478 fails to overcome the deficiencies of Nardoni.

Specifically, JP-'478 fails to teach or suggest, “...an electromagnetic wave absorber disposed between the chip part and at least one of the opposed opening end sections of the shielding conductor.”

Therefore, the Examiner is respectfully requested reconsider and withdraw this rejection.

### III. FORMAL MATTERS AND CONCLUSION

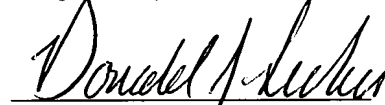
In view of the foregoing, Applicant submits that claims 1-20, the claims presently pending in the application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

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Respectfully Submitted,



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FIG. 8

